

DETAILED ACTION

Status of the application

Claim 1-6 and 9 canceled

Claims 7, 8, and 10-12 are pending and presented for examination

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 7 and 8** are rejected under 35.U.S.C. 102 (b) as been anticipated by Van den Syte et al. (US2002/0104589). Syte et al. teaches a method and apparatus for recycling a quenching gas, such as helium, to be used with a treating gas, such as a carburizing gas, for the treating of components in an atmospheric furnace. Syte's invention comprises: a quenching chamber (equivalent to V1 as claimed) coupled to a gas recovery device (equivalent to V2 as claimed) adapted for receiving spent treating gas and quenching gas which can be recycled between the quenching chamber and the recovery device(paragraph 20).

He further specifies **an option of a by-passing loop** by citing that "*a separate vacuum pump could be used in a **side process** connected to duct 24 before valve 23 to evacuate quenching chamber 20 so that a greater percentage of quenching gas is recovered*" (paragraph 42). Also (in paragraph 43), he mentions "*the oil flooded screw and diaphragm compressors could be replaced*

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with other style compressors and/or combined into one compressor". He goes on by specifying that" the raffinate could be placed in a separate receiver (Intermediate tank V3 as claimed) and serve as purge gas for the quenching chamber" (paragraph 46). Furthermore, the system could run continuously therefore helium content of the quenching gas would increase, therefore resulting in a smaller compressor requirement to get the same helium content in the quenching gas, thus further savings. (Paragraph 50). All the critical elements required by the claims are well taught and thus, the claims are clearly anticipated by the cited reference of the record.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

In view of the fact that the factual inquiries set forth in *Graham v. John Deere Co*, 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. **Claims 10 to 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Syte as applied to claim 7 above, and further in view of Bowe (In "Helium recovery and recycling makes Good Business Sense" by Donald J. Bowe, Air products & Chemicals inc., Allentown, Pa.). Syte teaches a method of recycling quenching gas, of at least one gas such as helium, however he does not specifically teaches how a gas mixture is controlled if used. Bowe teaches a generic helium recovery system to be used in any process with recycled helium stored independently from a virgin helium supply for back up with analyzer and control valves for mixing and make-up. It would have been obvious for one of an ordinary skill in the art to have separated tanks for the different gases used for quenching, and then add them proportionally as required by the in line analyzer to a dedicated head tank where the filling can be controlled in parallel and independently from the quenching sequences with computerized control as mentioned by Bowe of Air products to save time.

Response to Arguments

1. Applicant's arguments filed October 9th, 2008 have been fully considered but they are not persuasive. Applicant argues that " No where in the figures or in the description is an intermediate storage tank that collects the quenching gas then feeds the compressors or boosters disclosed". Examiner wants to point out that the cited reference clearly disclose in paragraph 46, and 51 that a separate tank (called receiver in the reference) cab be installed on the by-pass stream as well. The buffer tank at the by -pass does not show on the diagram but was discussed and disclosed in paragraph

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46. Furthermore, the balance of the system is a mere optimization of the process by means of control valves, sensors, mixers and computer software.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLETTE NGUYEN whose telephone number is (571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on (571)-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/COLETTE NGUYEN/
Examiner, Art Unit 1793

CN
December 21, 2008

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793